MARINE REVIEW.

VOL. XIII. CLEVELAND, O., MAY 28, 1896. No. 22.

Lake Freight Matters.

With the Carnegie Steel Co. and other large furnace interests still holding off in the matter of ore purchases for 1896, it is surprising that the lake freight market has held up so well under the additional disadvantage of a very marked falling off in the demand for grain carriers. This is especially true in view of the fact that even the ore companies that are in control of docks are bringing down little, if any, unsold ore.

Conditions now prevailing in the iron industry are certainly not as favorable to a heavy ore output as they were two months ago, but the business of making iron and steel is not to be suspended indefinitely, and the furnace companies that have not as yet bought ore for 1896 must soon come into the market. There is no thought of any reduction in the prices of ore fixed by the association. Even the furnace men are not suspected of any attempt to break these prices; but it can not be denied that their delay in making further purchases is a source of considerable worry to the ore dealers. It is now thought that purchases by the Carnegie company, which have been expected from day, to day will be made after the first of the month. Just now the furnace men would be at a disadvantage in purchasing, as they avoid a month's payments by waiting till the first of June.

Officials of United States Courts.

(FROM "BLUE BOOK OF AMERIBAN SHIPPING," TO BE PUBLISHED BY THE MARINE REVIEW AND NOW IN PRESS.)

The following list of United States courts, with names of judges, clerks and marshals, refers only to the districts bordering on the lakes:

UNITED STATES CIRCUIT COURT OF APPEALS.

Second circuit, including northern district of New York—Justice Henry B. Brown and Judges Wm. J. Wallace, E. Henry Lacombe and Nathaniel Shipman; clerk, James C. Reed, New York, N. Y.

Sixth circuit, including northern Ohio and eastern and western Michigan districts—Justice Henry B. Brown and Judges Wm. H. Taft and Horace H. Lurton; clerk, Frank O. Loveland, Cincinnati, Ohio.

Seventh circuit, including northern Illinois and eastern and western Wisconsin districts—Justice John M. Harlan and Judges Wm. A. Woods, James G. Jenkins and John W. Showalter; clerk, Oliver T. Morton, Chicago, Ill.

Eighth circuit, including district of Minnesota—Justice David J. Brewer and Judges Henry C. Caldwell, Walter H. Sanborn and Amos M. Thayer; clerk, John D. Jordan, St. Louis, Mo.

UNITED STATES DISTRICT COURTS.

Northern district of New York—Judge Alfred C. Coxe, Utica, N. Y.; clerk, Charles B. Germain, Buffalo; marshal, Fletcher C. Peck, Elmira.

Northern district of Ohio—Judge Augustus J. Ricks, Cleveland; clerk, H. F. Carleton, Clevelaud; marshal, M. A. Smalley, Cleveland.

Eastern district of Michigan—Judge Henry H. Swan, Detroit; clerk, D. J. Davison, Detroit; marshal, Eugene D. Winney, Detroit.

Western district of Michigan—Judge Henry F. Severns, Grand Rapids; clerk, John McInewan, Grand Rapids; marshal, Charles R. Pratt, Grand Rapids.

Northern district of Illinois—Judge Peter Grosscup, Chicago; clerk, T. C. MacMillan, Chicago; marshal, John W. Arnold, Chicago.

Eastern district of Wisconsin—Judge Wm. H. Seaman, Sheboygan; clerk, Edward Kurtz, Milwaukee; marshal, George W. Pratt, Milwaukee.

Western district of Wisconsin—Judge Romanzo Bunn, Madison; clerk, F. M. Stewart, Madison; marshal, F. W. Oakley, Madison.

District of Minnesota—Judge William Lochren, St. Paul; clerk, Wm. A. Spencer, St. Paul; marshal, Richard T. O'Connor, St. Paul.

It is to be hoped that there is sufficient grounds for the confidence of Mr. Burton and other members of congress in the ability of advocates of the river and harbor bill to pass that measure in both houses over a veto from the president. Of all the men who have ever gone to congress from the lake region, it can truthfully be said that few, if any, of them have ever worked as hard as Mr. Burton has worked during the present session to advance lake interests. All active members of the Lake Carriers' Association know that his labor has not been for Cleveland alone, and on this account he is deserving of the support of everybody who is in any way interested in the lakes.

Value of the Business Fleet of the Lakes.

(FROM "BLUE BOOK OF AMERICAN SHIPPING," TO BE PUBLISHED BY THE MARINE REVIEW AND NOW IN PRESS.)

Although reports of the United States commissioner of navigation show a total of 3,342 vessels of all kinds owned on the lakes on June 30, 1895, it is understood, of course, that this includes a very large number of small steam and sail vessels, yachts, unrigged craft, etc., that can not be included in the class of ships that carry freight and passengers between distant points, and which may be termed the business fleet of the lakes. The number and value of vessels composing this business fleet is best understood by reference to the Inland Lloyds Insurance Register, which aims to class all lake vessels that are entitled to insurance. This register, as revised on May 1, 1896, contained the names of 1,493 vessels, valued at $56 776,000, to which have been added, in the following table, the number of new vessels unfinished in the ship yards on the same date, making in all 1,544 vessels valued at $64,415,000.

	Number.	Value.
Steam vessels classed in Inland Lloyds Insurance Register, May 1, 1896	875	$48,951,000
Steam vessels under construction, May 1, 1896	44	5,764,000
Sail vessels and barges classed in register, May 1, 1896	618	7,825,000
Sail vessels and barges under construction, May 1, 1896	17	1,875,000
Total	1,554	$64,415,000

It can not be said that the foregoing figures represent the entire value of lake shipping. Few low-grade vessels of the B2 class, such as engage on short routes in the lumber trade, are given a place in the register referred to. The summary represents, however, the value of vessels that care for probably 80 per cent. of the freight and passenger traffic on these waters.

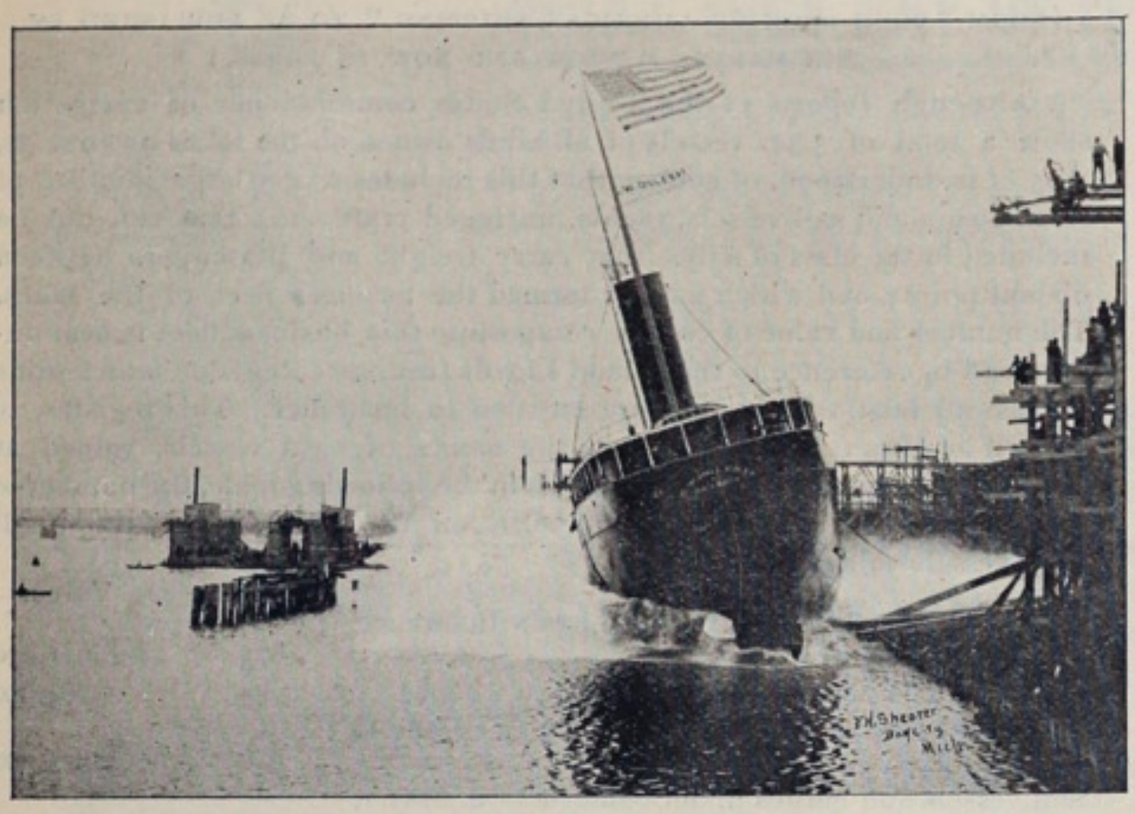
A large number of harbor tugs, fishing tugs and pleasure craft are not included in the summary. Neither does it take in any of the unrigged craft that are used by the dredging interests. It is, in short, a summary of values pertaining to only the best vessels of the lakes that are manned by crews numbering six to twenty-five hands.

Referring to the big car ferry, with tracks for thirty cars, that is being built by F. W. Wheeler & Co. of West Bay City for the Flint & Pere Marquette Railway, the president of the railway company says in his annual report: "It is expected that this boat will be ready for service during the coming autumn, at which time connections with the rails of the Chicago & Northwestern Railway and the Wisconsin Central Railroad will be made at Manitowoc. Under favorable conditions two round trips a day will be made by this steamer. Arrangements have been concluded with the Ann Arbor Railroad Co. for the use of its valuable terminal property in Toledo, and of its right of way and track from Alexis to the city. This will enable the Flint & Pere Marquette Railroad Co. to secure, at a moderate outlay, an independent entrance to a large and prosperous city, and a direct connection with the rails of the Columbus, Hocking Valley & Toledo Railroad, Pennsylvania Company, Wheeling & Lake Erie, Lake Shore & Michigan Southern Railway, Michigan Central Railway, and Cincinnati, Jackson & Mackinaw Railway; also with Wheeling and Michigan central belt lines, through which the other railroads centering in Toledo are reached."

It is plainly evident now that the car dumping machines are to replace, almost entirely, the old systems of loading soft coal at Lake Erie ports. Probably not less than ten of these big machines will be in operation before the present season is at an end. The machine that is to be operated by the Cuddy-Mullen Coal Co. on new docks erected by the Pennsylvania Company, within the eastern arm of the breakwater, Cleveland, was given two or three trials at loading vessels within the past week, and its operation is highly satisfactory. This is a side-dump machine, designed and built by the McMyler Mnfg. Co. of Cleveland, but not of the same type as the machine which that company built at Ashtabula some time ago. The Cuddy-Mullen company, through its arrangements with managers of the Pennsylvania railroad and the Northern Steamship Co., has laid the foundation for a big dock industry in the outer harbor at Cleveland, and they should be encouraged by an extension of the eastern arm of the breakwater, so as to insure smooth water at the docks throughout the season of navigation.

A Big Steel Sailing Ship.

Several freight steamers of 10,000 to 11,500 tons capacity have been built in British ship yards within the past two or three years, but for some reason there is not as much interest attached to the big steamship as there is to the sailing ship of less capacity. The capacity of the largest sailing ship in the world today is only 6,150 tons. The vessel is the Potosi, a steel five-master owned by F. Laeiz of Hamburg and which was built by J. C. Tecklenborg, Geestemunde, Germany. Her dimensions are:



LAUNCH OF THE STEAMER E. W. OGLEBAY AT WEST BAY CITY.

Length over all, 394 feet; between perpendiculars, 362 feet; width over the plating amidships, 49 feet 9 inches; depth from upper edge of keel to under the main deck amidships, 31 feet 2½ inches. Her register tonnage is 4,027 tons gross and 3,854 tons net; displacement on an average draft of 25 feet, 8,580 tons. This colossal sailor is built in accordance with the regulations of the Bureau Veritas and the English Lloyds for the highest class and under special survey of those institutions, and with extra stiffening and strengthening arrangements in view of the heavy masting and the enormous pressure of the sails. Two steel decks run over the whole length of the vessel, the upper one being sheathed yellow pine, and besides there is another deck in the fore peak and the bridge deck, also of steel, covered with wood. The structures above the main deck comprise a short poop deck, under which is placed the steering apparatus, a bridge house 70 feet long containing accommodation for a crew of about forty-four men, a passenger cabin, the cook's galley, provision store, hospital and a spacious sailroom; then there is a forecastle, under which is located the cable capstan, and which provides storage spaces for lamps, oil, paint and boatswain's stores. The steering of the ship is effected by means of an apparatus placed on the bridge deck and furnished with a pair of teak hand wheels connected with the steering gear under the poop deck by means of a rope of galvanized steel wire. The rudder itself consists of a frame of cast steel, into which a steel plate is riveted and the pintles are inserted. Besides the large capstan for raising the anchors (the latter weighing about three tons) there are two others on the main deck, a large one on the forecastle, two on the bridge deck, besides thirteen for working the sails and loading and unloading cargo. The ship carries four boats, two of which are large iron patent life boats. The Potosi is rigged as a five masted bark with double topsail and topgallant yards. The masts and larger yards are of steel, the height of the mainmast, from keel to truck, being 210 feet, and its diameter at the deck 34 inches. All of the standing tackle is of galvanized iron and the running gear partly of wire and partly of hemp. The spread of canvas, with all sail set, is equal to about 5,000 square yards. In this ship the mast in the bow is called foremast and then following aft the names are greatmast, middlemast, crossmast and besanmast.

Full Summary of River and Harbor Appropriations.

Following is a complete summary of appropriations applying to the lakes, which were contained in the river and harbor bill as it was finally passed by both houses of congress:

Lake Ontario—Charlotte, $12,000; Wilson. $5,000; Great Sodus Bay, $8,000; Little Sodus Bay, $8,000; Ogdensburg, $20,000; Oswego, $60,000; Pultneyville, $1,500; Cape Vincent, $25,000.

Lake Erie—Buffalo, extending breakwater southerly to Stony Point, $35,000, with provision for continuous contracts involving $2,200,000; Dunkirk, $10,000, with provision for continuous contracts involving $398,258; Tonawanda and Niagara river to north line of village of North Tonawanda, $50,000; Erie, resurvey out of money heretofore appropriated; Ashtabula, $50,000, not less than $40,000 of which is for breakwater; Lorain, $30,000, and survey for more extensive improvements; Cleveland, $80,000, with provision for continuous contracts involving $1,354,000, and also survey with a view to determining advisability of changing present plan of breakwater, so as to extend eastern arm eastwardly in a general direction parallel with the shore; Fairport, $30,000, of which $20,000 is for breakwater; Huron, $8,000; Port Clinton, $6,000; Sandusky, $40,000, and survey of bar at mouth of harbor with a view to securing permanent navigable channel next to Cedar point; Toledo, straight channel and harbor, $150,000; Vermillion, $2,000; Conneaut, $40,000, of which $20,000 is for breakwater; Monroe, $5,000.

Lake Huron—Sand Beach, $16,000; Alpena, $2,500.

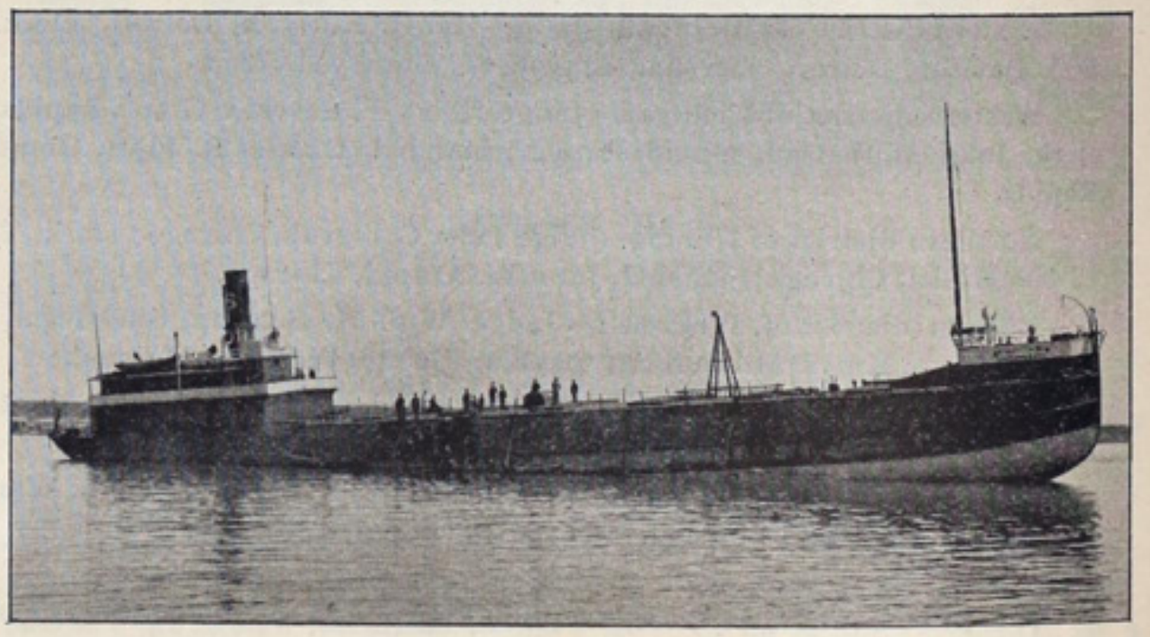
Lake Michigan—Michigan City, $80,000 for outer and inner harbor; Calumet harbor; Chicago, $75,000; Waukegan, $20,000; Charlevoix, $20,000; Frankfort, $15,000; Grand Haven, $20,000; Manistee, $15,000; Holland, $10,000; Muskegon, $30,000; Pentwater, $5,000; Benton Harbor canal and harbor at St. Joseph, $30,000; South Haven, $15,000; White Lake, $5,000; Ludington, $25,000; Petoskey, $8,000; Saugatuck, $10,000; Menominee, $7,150; Cheboygan, $12,000; Ahnapee, $5,000; Green Bay, $30,000, of which $5,000 may be expended on Fox river; Kenosha, $24,000; Manitowoc, $44,440; Milwaukee, harbor of refuge, $20,000, with provision for continuing contracts involving $168,737.91; Milwaukee harbor, $7,000; Port Washington, $5,500; Racine, $27,000; Two Rivers, $5,000; Sheboygan, $26,000; Sturgeon Bay canal, harbor of refuge, $5,000; Oconto, $4,000; Pensaukee, $1,000; Sturgeon Bay and Lake Michigan ship-canal $30,000; South Milwaukee, $5,000; Kewaunee, $25,000.

Lake Superior—Ontonagon, $10,000; Portage lake, harbor of refuge, $25,000; Marquette, $24,000; Presque Isle point, near Marquette, harbor of refuge, $29,000; Ashland, $27,000; Duluth and Superior harbors, $50,000, of which $30,000 is for Duluth portion and $20,000 for Superior portion, with provision for continuing contracts involving $3,080,553; Grand Marais, Minn., $3,000; Agate Bay, $50,000; Grand Marais, Mich., harbor of refuge, $24,000.

Connecting rivers and rivers tributary to the lakes: Chicago river from its mouth to stock yards on south branch and Belmont avenue on north branch, $50,000, with provision for continuous contracts involving $650,000 for 16 feet navigation; Calumet river, Illinois, from mouth to two miles south, $50,000; Illinois river, $40,000; Illinois and Mississippi canal, $25,000, with provision for continuous contracts involving $5,710,650; Pine river, Michigan, $5,000; Black river, Michigan, $4,000; Black river at Port Huron, $4,000; Clinton river, Michigan, $10,000; Rouge river, Michigan, $5,000; Detroit river, shoals from Detroit to Lake Erie, $30,000; water communication across Keweenaw point, Michigan, $50,000, with provision for continuous contracts involving $1,065,000; St. Joseph river, Michigan, $500; Kalamazoo river, Michigan, Lake Michigan to Saugatuck, $5,000; Menominee river, Wisconsin and Michigan, $15,000; Belle river, Michigan, $5,000; Sebewaing river, Michigan, $5,000; Saginaw river, Michigan, $40,000, of which $16,000 is to be expended above Bay City, and also provision for several surveys with a view to securing a channel 200 feet wide and 14 to 16 feet deep in navigable parts of the river; Grand river, Michigan, $50,000; Niagara river, New York, from Tonawanda to Port Day, $10,000.

Waldo-Choctaw Collision.

A view of the Lake Superior Iron Co's. steamer Choctaw, after being run into by the new steamer L. C. Waldo of Detroit, is presented herewith. The collision occurred off Spry's lumber dock, Sault Ste. Marie,



STEAMER CHOCTAW AFTER COLLISION WITH THE L. C. WALDO.

and the picture shows the Choctaw after she was beached to prevent sinking in deep water The Choctaw was bound up, light, and the Waldo was bound down with ore. Captains of both vessels are disposed to withhold particulars of the collision. A statement to the effect that Capt. Dudd'eson of the Waldo had said that the collision was due to the breaking of his whistle cord is denied. Repairs to the Choctaw will be very heavy. The Waldo's injuries will not cause great delay, but the repair of damages above water will amount to $7,000 or $8,000.

Cleveland's Maritime Board.

A BRIEF STATEMENT OF ITS OBJECT—AUXILIARY TO THE CHAMBER OF COMMERCE AND IN HARMONY WITH THE LAKE CARRIERS' ASSOCIATION.

The Maritime Board, auxiliary to the Cleveland Chamber of Commerce, was organized in September, 1895. Its object, briefly stated, is to promote the maritime interests of Cleveland; also of the great lakes in measures for the general good when the local interests of Cleveland are specially involved.

It is in no sense antagonistic to the work of the Lake Carriers' Association, nor is it competitive; it will simply work in harmony with and assist that great inter-lake organization along certain lines. Its work however will be largely local; doing work not within the function of the Lake Carriers' Association, except where local action is necessary to the general interests.

The Maritime Board has passed through its tentation stage and has amply justified its organization. The Chamber of Commerce has, so far, almost wholly maintained it, but the time has come to place it on an independent financial basis. The expense of maintaining it will be small. It is estimated that an annual membership fee of $5 will be ample. Any member of the chamber whose business is related directly or indirectly to the marine interests of Cleveland is eligible for membership in the board. The following are eligible, many of whom having already become members, viz.: Owners and agents of water craft (freight carriers, harbor tugs and passenger steamers), owners of dock property, lake shippers and consignees, dealers in ship supplies, marine underwriters, ship and marine engine builders, ship brokers, etc. Members not owners of vessel property, which comprise the larger number, will exert a potent influence in the Maritime Board.

Time was when the vessel owners of Cleveland had to fight their battles alone. Happily now, through the influence of the Chamber of Commerce, other persons indirectly related to the vessel business have become interested. They are organized with the vessel owner in the effort to secure river and harbor improvements and to equip Greater Cleveland with the best facilities necessary to her supremacy as a shipping and receiving port. With such interested and able allies the vessel owners of Cleveland will achieve for the city's interest results that aforetime would have been impossible. But such work can only be done through organization, and the Maritime Board is established for such special purpose.

Outside tonnage as well as our own is interested in the improvement of our river and harbor. Wider, straighter and deeper channels, increased dock room, and better facilities for the rapid handling of cargoes, is to the advantage of the entire lake tonnage. But at the same time, such improvements will largely increase the business done at this port and materially aid the development of Cleveland. The great advantage of our lake business to Cleveland, as a factor in creating prosperous times, is more and more realized. You frequently hear the expression: "When the lake business is good all business is good." This is true and is so for the reason that the lake business is co-related to and stimulates all other branches of business.

The Lake Carriers' Association was complimented by the selection of Capt. W. S. Mack, a prominent member, as chairman of the governing committee of this board. Other members of the Lake Carriers' Association are on the committee. John M. Mulrooney of the MARINE REVIEW has been chosen secretary. It goes without saying, therefore, that there will be no friction with the Lake Carriers' Association. Both associations will work in harmony in the field of work they mutually cover, but with the force of two separate organizations. In memorializing congress, or in action to influence our city council, the benefit of two separate bodies taking action for the same object will be plainly obvious. Besides, the need of such a body as the Maritime Board to shape and direct, in some sense, the local maritime improvements now proposed is clearly apparent. The action of such a body, in view of the peculiar fitness of its members, many of whom have had long experience on the river among marine men, will be especially valuable to those charged with the task of conducting the improvements projected for the city's welfare.

B. L. PENNINGTON.

There has recently been rolled at the works of the Stockton Malleable Iron Company, Limited, Stockton-on-Tees, a steel plate weighing 5 tons 10 cwt., the sheared size being 76 feet 3 inches by 5 feet by $\frac{13}{20}$ inch thick, The width before shearing varied from 6 feet 2 inches to 5 feet 2 inches. and when finished the plate was without a flaw, and in every way up to Lloyd's requirements. This is the largest plate ever rolled in Great Britain and probably the largest ever rolled in any country.

Gen. G. B. Williams of Philadelphia and Geo. W. Dickie of San Francisco, who went to Japan in the interest of the Cramps and the Union Iron Works, have returned without any assurance of contracts for war vessels. They say, however, that the Japanese government is favorably impressed with our ships.

River and Harbor Appropriations Since 1878.

Appropriations made by the United States government for river and harbor improvements since 1878 have amounted to $281,309,429.81 This includes the items known as continuous contract items, which, after their adoption, are provided for in what is known as the sundry civil appropriation bill. The following table shows appropriations of the different bills that have been passed since 1878:

FUNDS PROVIDED FOR RIVER AND HARBOR IMPROVEMENTS BY THE UNITED STATES GOVERNMENT

Years.			Appropriations.
1878			$ 8,201,700.00
1879			7,864,600.00
1880			8,951,500.00
1881			11,441,300.00
1882			18,738,875.00
1884			13,949,200.00
1886			14,473,900.00
1888			22,397,616.90
1890.	Direct appropriations	$25,136,295.00	38,419,274.00
	Contracts authorized	13,282,979.00	
1892.	Direct appropriations	$21,154,218.00	52,914,739.00
	Contracts authorized	31,760,521.00	
1894			11,473,180.00
1896.	Direct appropriations	$12,852,235.00	72,501,544.91
	Contracts authorized	59,649,309.91	
	Total		$281,309,429.81

As regards the present bill, which has not as yet been disposed of on account of the uncertainty that attended its presentation to the president for his signature, the following statement is made:

The bill as it passed the house of representatives carried appropriations amounting to	$10,453,860.00
And contracts amounting to	51,721,210.91
As the bill passed the senate it carried	12,752,350.00
And contracts amounting to	60,473,121.91
As finally passed by both houses it carried	12,852,235.00
And contracts amounting to	59,649,308.91

Additional Appropriations for the Lakes.

In addition to the appropriations for all river and harbor purposes on the lakes reported elsewhere in this issue, vessel owners will be interested in several items contained in the sundry civil appropriation bill. As finally passed by both houses this bill contained the following appropriations for revenue cutters, aids to navigation, etc.:

Two revenue cutters of first class for service on the great lakes, to cost together $400,000, of which $200,000 is now appropriated	$200,000
Channel connecting waters of great lakes between Chicago, Duluth and Buffalo	200,000
Surveys and corrections in charts, under direction of army engineer corps	27,000
Two range-light stations in Sandusky bay	30,000
St. Joseph pierhead fog signal, Lake Michigan	5,000
Carlton island light-station, St. Lawrence river	6,000
Galoo island fog signal, Lake Ontario	5,700
Lights on Portage lake, Portage lake ship-canal and Portage river, Lake Superior	10,000
Big Sable fog signal, Lake Michigan	5,500
Menominee light and fog signal station, Lake Michigan	5,000
Devil's island light-station, Wisconsin—Use of unexpended balance for constructing keeper's dwelling	.....
Marine hospital, Detroit—Isolation ward	1,000
Marine hospital, Chicago—Several improvements	7,450
Total	$502,650

Stocks of Grain at Lake Ports.

The following table, prepared from reports of the Chicago board of trade, shows the stocks of wheat and corn in store in regular elevators at the principal points of accumulation on the lakes on May 23, 1896:

	Wheat, bushels.	Corn, bushels.
Chicago	15,023,000	3,500,000
Duluth	8,485,000	.....
Milwaukee	567,000	2,000
Detroit	166,000	16,000
Toledo	355,000	98,000
Buffalo	1,249,000	325,000
Total	25,845,000	3,941,000

As compared with a week ago, the above figures show at the several points named a decrease of 855,000 bushels of wheat and 774,000 bushels of corn.

Round trip excursion tickets between Cleveland Lorain may be secured via. the Nickel Plate road at $1.00. 79 July 31

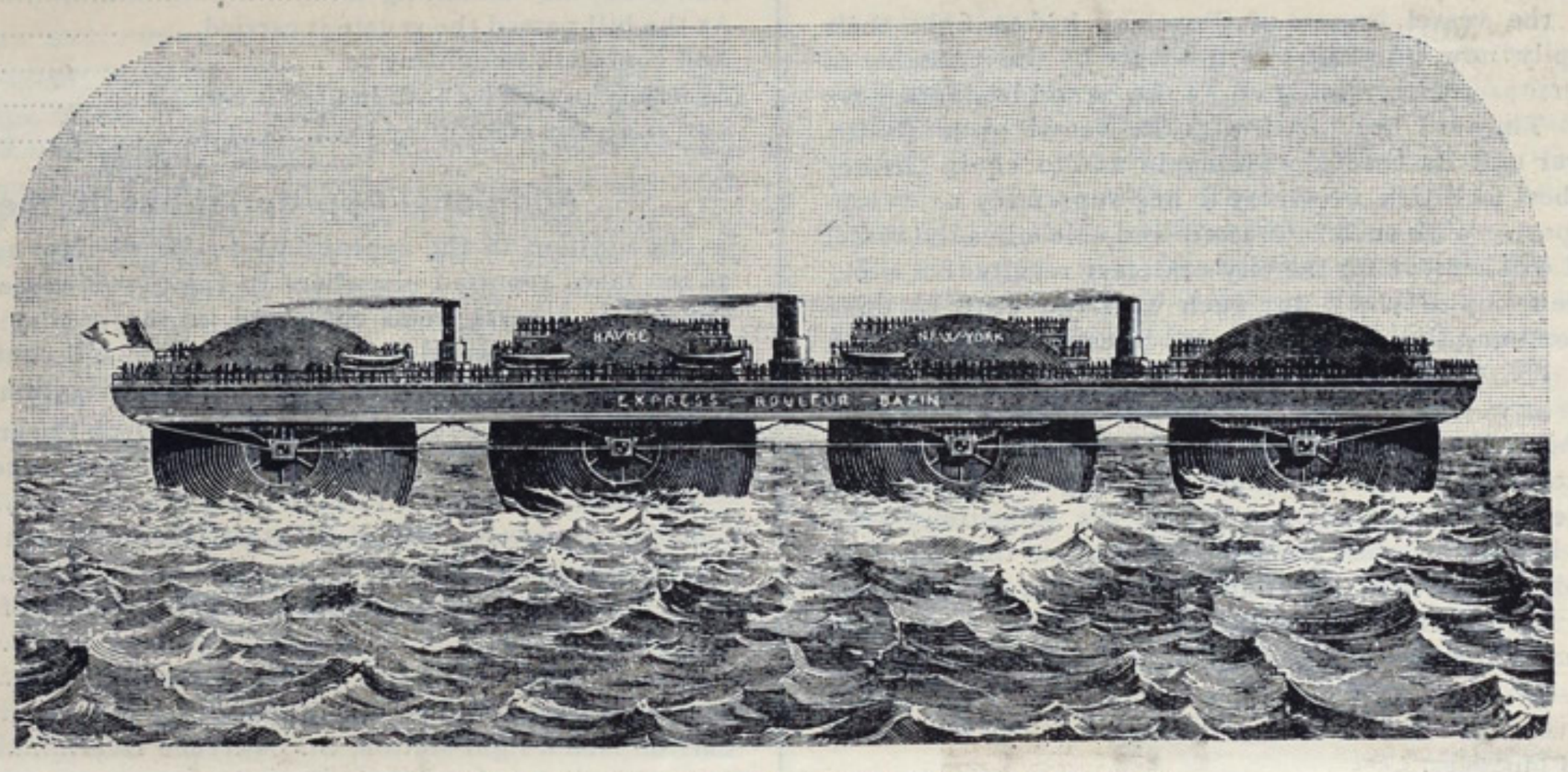
The French Roller Ship.

When pictures of the Bazin roller ship first appeared in various technical publications, a year or more ago, there was a general disposition to regard the ideas of the French inventor as entirely visionary. The boat on rollers was said to be as old as the steam engine, and accounts of the ship which it was proposed to build at St. Denis were read simply on account of the novelty of the scheme. But now that a boat of this kind has actually been built, and is to be tried next month, some of the foremost naval architects of Europe have become thoroughly interested in the experiments, and the leading engineering journals of England are giving considerable attention to the vessel. The experimental boat now nearing completion at the works of the Cail Company, St. Denis, is of the following dimensions: Number of floats, six; diameter of the floats, 10 meters; length of the boat, 39 meters; breadth, 12 meters; superficial area of the midship frame, about 50 meters; burden, 274 tons; power developed by the boiler, 700 horse power, of which 550 horse power will be upon the propeller and 150 horse power on the axes of the floats. There will be a separate engine for the propeller and for each pair of the disc wheels. The Paris correspondent of the Engineer of London writes as follows regarding the inventor and his experiments:

"Though at one time the roller ship met with a great deal of criticism among marine experts, who were rather skeptical as to its success from the generally accepted ideas of naval design, it is significant that a fuller acquaintance of the theory laid down by M. Bazin has led them to place faith in the capabilities of the disc wheel vessel. This theory is by no means a new one with M. Bazin, who has been working at it for twelve years or more, and an inspection of the models to be seen at his works shows that the system has been applied in a great many different ways before the inventor was able to evolve the remarkable vessel which is now to be put to a practical test. It may be said that the first idea of M. Bazin was to apply a revolving motion to the vessel for the driving action in order to overcome the enormous waste of power due to the resistance of the water and the friction. As is well known, this resistance is proportional to the square of the speed of the vessel, and as the ratio of horse power necessary to drive a ship increases enormously with the high speeds sought to be obtained, it is believed that the limit in the keel boats has almost been reached. In the problem which he has set himself to solve, M. Bazin believes he has suppressed the resistance of the water to the forward movement of the vessel, and in so doing he has not only added to the speed, but has secured, he says, great economy in motive power as well. To attain this end he designed a vessel in which a flat rectangular deck would be supported by hollow disc wheels of steel running upon their axes. Experiments were made to show the action of these wheels in the water, and in the presence of a large company they were repeated a few days ago by M. Bazin in a tank constructed for this purpose. First, a hollow wheel was placed in the tank, and it floated vertically with about a third of its bulk immersed. Spun round without any forward movement, the wheel continued to revolve for some time without moving from its place, and this proved to M. Bazin that he could not rely upon the revolution of the wheel alone for the propulsion of the vessel. He then pushed the wheel forward without revolving it, and the effect was exactly the same as with an ordinary keel, that is to say, it threw up a good deal of water in front and left a trail behind. Moreover, it only advanced 4 or 5 feet, and did not show the slightest tendency to revolve. This convinced the inventor that he would have to give the wheel both a revolving and a forward motion. Thereupon, spinning the wheel and pushing it forward, the hollow disc traveled the whole length of the tank with scarcely any agitation to the water whatever.

"But it was found that nothing was to be gained by revolving the disc too quickly, and that it was merely necessary to do this in proportion to the propelling force of the screw. Under these circumstances, the relative power upon the propeller and the wheels would have to be calculated with a certain nicety, as the discs would have to turn in exact proportion to the distance covered by the boat. This fact having been settled, other experiments were undertaken to demonstrate the stability and speed of the wheels. A framework carrying six disc wheels, three on each side, was placed in the tank. A cord was attached to it and drawn up over a pulley, carrying a weight which represented a certain propulsive force. The frame was pulled back to one end of the tank and allowed to go forward by the action of the weight at the end of the cord. According to the watch, the time occupied in traveling the whole length of the tank was twenty-three seconds. The same experiment was then repeated with the wheels revolving by clockwork, and though losing two or three seconds at the start before getting up full speed, the apparatus went from one end of the tank to the other in eleven seconds. By comparing these results, M. Bazin estimates that the speed of a disc wheel steamboat would be 31 or 32 knots, while the smaller power required results, according to his estimate, in an economy of about 66 per cent. of coal. One of the advantages claimed for the system is the practical impossibility of sinking. If one or more of the wheels were perforated in collision, the vessel would not do more than sink a few feet.

"Having thus, as he considers, demonstrated the speed, economy, stability, and safety of the Bazin wheels, the inventor showed a working model in a large basin constructed for that purpose. As the model is on a scale of one-twenty-fifth of a transatlantic boat, which it is proposed to build with a length of 130 meters, the deck or platform represents a height of 6 or 7 meters above the sea, while the upper deck is about 13 meters above the water level. The deck itself is built up with girders, and being hollow, it has an enormous carrying capacity, either for merchandise or coal. There are eight discs or floats, four on each side, and owing to their convex form they offer little resistance to the wind, while the head wind has a clear passage underneath the deck. The motive power was supplied by dynamos, one working the propeller and four others turning the floats. Upon the connection being made the propeller revolved with great rapidity, and the wheels turned slowly, and after a few seconds lost in getting under way, the model sailed the whole length of the basin at great speed.



ROLLER SHIP—TO BE TRIED IN FRANCE NEXT MONTH.

The Rickmers of Bremen, well-known vessel owners, have just received two more big ships from English builders. They are screw steamers designed for trade between China and Germany, and have been named Maria and Ellen Rickmers. They are each 427 feet long, 50½ feet beam and 30 feet depth and will carry about 7,200 tons each. Engines are triple expansion, with cylinders of 27, 34 and 72 inches diameter and a common stroke of 48 inches. Steam is supplied by four multitubular boilers, working at 180 pounds pressure.

J. C. Gilchrist of Cleveland paid $5,000 to Henry Johnson and others for the burned steamer V. Swain. He has made no arrangements with Capt. Hursley regarding a purchase of the wrecked schooners Moonlight and Kent. If the vessels are brought to Cleveland, he says, he may make an offer on them but has not done so as yet.

Ship Yard Matters.

A Detroit correspondent says: "Launches are so common of late that little attention was paid to the launch of the steel lumber carrier Aragon at Wyandotte on Saturday last. C. R. Jones of Cleveland and a few others interested in the boat and the ship yard were present. The Aragon will be brought to Detroit in a few days to receive her engines and boiler, which are now on the sheer dock ready for shipment. The steam barge Marquette, owned by J. W. Moore and others of Cleveland. is now having her old boiler taken out and also her two low pressure cylinders. She will be fitted with fore-and-aft compound engines and will also receive a new Scotch boiler, built by the Lake Erie Boiler Works and fitted with Howden draft apparatus by the dry dock company. This boiler is also on the dock and will be placed on board at once. In the boiler shop at the Dry Dock Engine Works the new boiler building for the steamer Iron Age is well advanced. This boiler will also be fitted with Howden draft. At the Frontier Iron Works quite a number of experiments have been made of late with a gas engine of new design. The Frontier works is now manufacturing a number of these engines, and with their marine work this keeps them quite busy. Chas. Young, who for some years past has been foreman of the sheet metal department of the Detroit Sheet Metal and Brass Works, is now general superintendent of the entire works. Mr. Young has the best wishes of many friends, especially among marine men, in his new undertaking."

At Toronto, on Saturday last, the Bertram Engine Works Co. launched the side-wheel passenger steamer Corona, which they are building for the Niagara Navigation Co. This vessel is of steel, and is to ply between Toronto, Niagara, Queenston and Lewiston. She was designed by Mr. A. Augstrom, who was for some time with the Cleveland Ship Building Co. This vessel is expected to be very fast. She will carry about 1,400 excursionists. Her dimensions are: Length over all, 277 feet; length of keel, 270 feet; beam, moulded, 32 feet; beam, over guards, 59 feet; depth, moulded, 13½ feet. Engines are of the compound inclined type, with cylinders of 45 and 85 inches diameter by 66 inches stroke. Her feathering wheels are 20 feet 6 inches diameter and 9 feet 9 inches face. She will have six boilers of the gunboat type, each 8 feet diameter and 16 feet long and each having two 36-inch furnaces. Forced draft will be furnished by two 90 inch steel fans with direct connected engines.

The tonnage of three steel lake tugs is announced by the bureau of navigation. They are: Edna G., Duluth, 154.15 tons gross, 67.44 net, No. 136,545; T. C. Lutz, Chicago, 136.26 tons gross, 70.32 net, No. 145,718; Chief, Duluth, 10.35 tons gross, 7.04 net, No. 127,033.

W. J. Connors' $65,000 steel steam yacht is about ready for launching at the works of the Union Dry Dock Co., Buffalo.

Navigation of Niagara River.

With increased draft of water and a constant growth of Niagara river commerce, it has been found necessary to ask masters of steam vessels of all kinds to give close attention to the following signals for passing the draw of the international bridge:

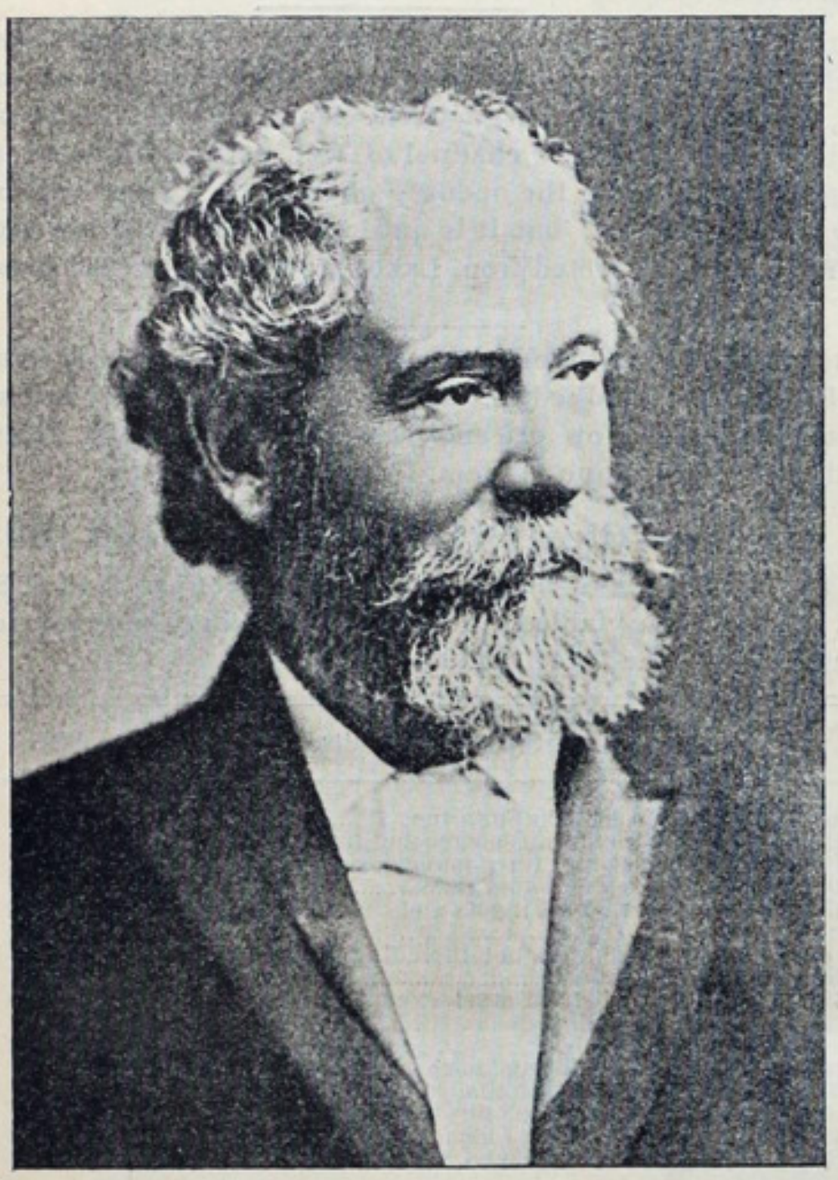
First—On entering the river, and when opposite the dummy light, one long blast of the whistle must be sounded, continuing at least thirty seconds, to distinguish it from ordinary tug whistles.

Second—In approaching from above, leave buoys on starboard side and pass through draw on port side of swing pier.

Third—At night a red light will be placed on the up and down stream ends of the pivot pier rests; also two red lights on the pivot pier—one on each side to mark the channels. A red light will be placed on each of the two piers on each side of the pivot pier. The bridge will be provided with three lights, placed about 15 feet above its top, viz.: One in the center and one near each end. These will show three red lights to navigators when the bridge is closed against vessels; and when the bridge is open for vessels to pass, the three lights will show green to midway between the extreme red lights of the pivot pier and the red lights on the pier of the fixed spans.

Fourth—During the day, if from any unforeseen cause or accident the swing should not open on the approach of vessels, a red flag indicating danger, will be hoisted on the flag-staff on the swing; at night a red light will be hoisted.

Fifth—In foggy or smoky weather, when vessels are approaching the bridge, keep a sharp lookout for short fog whistles from the tug International, and from the draw engines, at intervals of ten seconds, until draw is sighted.



John Isaac Thornycroft.

James Howden.

ENGINEERS OF GREAT BRITAIN WHO HAVE GIVEN SPECIAL ATTENTION TO MARINE BOILERS

Richard Lamb, the civil engineer and inventor whose electric bank haulage system was put in operation last year at Tonawanda, has worked out a model of a system of electric operation for the Erie canal. It will be exhibited at the National Electric Exposition. The model is 40 feet long, 6 feet high and 3 feet wide. Small boats will be operated in it by means of electricity.

The schooner Mary D. Ayer, which was sunk on Lake Michigan recently as a result of a collision with the steamer Onoko, was built at Saginaw forty-two years ago, and as a successful grain carrier, when a strong vessel, she was known as the Jesse Hoyt.

Capt. Thos. Delargie will succeed Capt. Frank Brown in charge of Pickands, Mather & Co's fuel business at Ashtabula Harbor. Capt. Brown takes charge of M. A. Hanna & Co's new fuel lighter.

About thirty-five big ore carriers were in port at Ashtabula Monday.

MARINE REVIEW

DEVOTED TO THE LAKE MARINE AND KINDRED INTERESTS.

Published every Thursday at No. 409 Perry-Payne building, Cleveland, O by John M. Mulrooney and F. M. Barton.

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The books of the United States treasury department on June 30, 1895, contained the names of 3,342 vessels, of 1,241,459.14 gross tons register in the lake trade. The number of steam vessels of 1,000 gross tons, and over that amount, on the lakes on June 30, 1895, was 360 and their aggregate gross tonnage 643,260.40; the number of vessels of this class owned in all other parts of the country on the same date was 309 and their tonnage 652,598.72, so that half of the best steamships in all the United States are owned on the lakes. The classification of the entire lake fleet on June 30, 1895, was as follows:

Class.	Number.	Gross Tonnage.
Steam vessels	1,755	857,735.13
Sailing vessels	1,100	300,642.10
Unrigged	487	83,081.91
Total	3,342	1,241,459.14

The gross registered tonnage of vessels built on the lakes during the past five years, according to the reports of the United States commissioner of navigation, is as follows:

	Number.	Gross Tonnage.
Year ending June 30, 1891	204	111,856.45
" " " 1892	169	45,968.98
" " " 1893	175	99,271.24
" " " 1894	106	41,984.61
" " " 1895	93	36,352.70
Total	747	335,433 98

ST. MARY'S FALLS AND SUEZ CANAL TRAFFIC.

(From Official Reports of Canal Officers.)

	St. Mary's Falls Canal.			Suez Canal.		
	1895.*	1894.	1893.	1895.	1894.	1893.
No. vessel pass'ges	17,956	14,491	12,008	3,434	3,352	3,341
T'n'ge, net registd	16,806,781	13,110,366	9,849,754	8,448,246	8,039,175	7,659,068
Days of Navigat'n	231	234	219	365	365	365

* 1895 figures include traffic of Canadian canal at Sault Ste. Marie, which was about ½ per cent. of the whole, but largely in American vessels.

IT IS MORE than probable that the next marked change in the big ore and coarse freight carriers of the lakes will be to move engines and boilers forward so as to admit of at least three or four cargo hatches in the stern portion now occupied by machinery. "If we build another ship like the Coralia," said Mr. L. C. Hanna, a few days ago, "this question must be the first to receive serious consideration. No matter how much strength or weight of material is put into a ship of 400 feet length, under the limit of beam and depth that prevails on the lakes, it would certainly seem impossible to entirely overcome the structural disadvantage that is involved in locating heavy triple expansion engines and big cylindrical boilers away back in the stern, actually to the fantails of these big steamers. Something must be done to overcome this disadvantage of all the weight in the stern, and a change to engines nearer amidships seems to be the only alternative." Mr. L. C. Hanna is president of the Mutual and Menominee transportation companies and he is also a large stockholder in the Globe Iron Works Company. He is the active managing member of the firm of M. A. Hanna & Co., and has been in charge of the ore and vessel business of that firm since its organization. His opinion on this important question is certainly worthy of consideration. He is warranted in referring to the subject in plain language, as the steamer Coralia, to which he refers, although the biggest carrier now afloat on the lakes, is probably built as substantially as any vessel that has ever been turned out of a lake ship yard.

FROM ALL that can be learned of the grain shovelers union just organized in Buffalo, it would seem that there is no reason to expect, on account of this organization, any break in the satisfactory arrangements that have prevailed between the Lake Carriers' Association and the grain shovelers since Contractor Kennedy took hold of this work a little more than a year ago. The new organization is made up of the men who actually do the grain shoveling, and reports of their meetings indicate that they are well satisfied with Mr. Kennedy and his methods. In fact it is understood that the union has the approval of the contractor. In view of the outside influence that had been exerted to disturb the present satisfactory arrangements in the grain shoveling business, it is more than probable that both Mr. Kennedy and his men concluded that it would be better that they should have a union of their own.

IT IS PROBABLY unnecessary to note that Mr. Jesse H. Farwell of Detroit was by no means an uninterested spectator in the late controversy over the Detroit river bridge bill. Mr. Farwell's communications to newspapers and his correspondence generally on this subject during the past six months would make up a printed volume of a great many pages. He is deserving of special credit from the vessel interests. One thing is noted in all of his communications. He does not go into particulars as to how a bridge may obstruct. There are some things, he holds, that should be self-evident, and this is one of them. This bridge question is one in which Mr. Farwell is thoroughly interested and he will be heard from again if it comes up in congress, as it very probably will at the next session.

MARKED REDUCTIONS in lake freights during the past two weeks have discouraged vessel owners, but there is some consolation in looking back to the rates of a year ago. At this time in 1895 ore was being carried in large quantities from the head of Lake Superior to Ohio ports at 75 cents a ton. The rate did not advance to 80 cents last year until June 1, and 90 cents was not paid until Aug. 3. The first dollar charter was made on Aug. 27 and then there was a steady rise until Nov. 2 when the $2 mark was reached.

NOW THAT the use of the new American lock at Sault Ste. Marie is assured for three or four months during the latter part of the present season, the engineers in charge of the Sault river improvements are also expecting to have a narrow channel of full depth completed at the Encampment shortly after the opening of the lock. They will not talk officially on the subject, but it is quite probable that a few big loads on deep draft may be expected from Lake Superior before the season is at an end.

ANOTHER EFFORT to place a high tonnage tax on ore mined in the state of Minnesota is talked of. It would seem that there are some questions regarding the iron ore and vessel business of the lakes that will never down. This is one of them.

Iron and Steel Products in 1894 and 1895.

In the latest issue of the Bulletin of the American Iron & Steel Association the following table is presented, showing the great increase in production of iron and steel in 1895 over 1894:

ARTICLES.—Gross tons, except nails.	1894.	1895.
Shipments of iron ore from Lake Superior	7,748,932	10,438,268
Production of pig iron, including spiegel and ferro	6,657,388	9,446,308
Production of spiegeleisen and ferro-manganese	120,180	171,724
Production of Bessemer steel ingots	3,571,313	4,909,128
Production of open-hearth steel ingots and castings	784,936	1,137,182
Production of all kinds of steel	4,412,032	6,114,834
Production of structural shapes, not including plates	360,305	517,920
Production of plates and sheets	682,900	991,459
Production of all rolled iron and steel, except rails	3,620,429	4,883,438
Production of Bessemer steel rails	1,016,013	1,299,628
Total production of steel rails	1,021,772	1,306,135
Production of steel rails, including above	157,457	163,109
Production of iron and steel cut nails, in kegs	2,425,060	2,129,894
Production of iron and steel wire nails in kegs	5,681,801	5,841,403
Production of iron and steel wire rods	673,402	791,130
Production of all rolled iron and steel, including rails	4,642,211	6,189,574

The production of iron ore in the United States in 1895 has been ascertained for the United States Geological Survey by Mr. John Birkinbine. It amounted to 15,957,614 gross tons, against 11,879,679 tons in 1894, an increase of 4,077,935 tons. Our imports of iron ore in 1895 amounted to 524,153 gross tons, against 168,541 tons in 1894, an increase of 355,612 tons.

Production of Coal in the United States.

Reports of the Geological survey show that the total output of coal in this country during 1895 was 171,804,742 long tons, having a total value at the mines of $197,572,477, an increase over the production of 1894 of 19,350,000 long tons, and an increase in value of about $11,500,000. The product of bituminous coal increased from 118,820,405 short tons of 2,000 pounds in 1894 to 134,421,974 short tons in 1895, a gain of over 15,500,000 tons. The value increased about $8,000,000. There was an increased production in all but five of the twenty-nine states producing bituminous coal. The output of anthracite coal in Pennsylvania increased from 46,358,144 long tons in 1894 to 51,785,122 long tons in 1895, a gain of over 5,400,000 long tons. The value increased only about $3,500,000—from $78,488,063 to $82,019,272—showing that anthracite coal was cheaper in 1895 than in 1894.

General Superintendent Kimball of the life-saving service has issued a circular forbidding members of a life-saving crew, during the active season, engaging in ferrying, boating, fishing or similar employment for pay or market, in competition with other persons engaged in such business.

Utilizing the Lachine Rapids.

The Lachine rapids of the St. Lawrence river are at last to be utilized. For some time past, work has been carried on by the Lachine Rapids Hydraulic Co., upon a large wing dam which runs out for more than a thousand feet into the St. Lawrence river. A fall of water is secured by means of this dam, sufficient to develop at the low water season 15,000 horse power. This water power is to be transformed into electricity. Upon the dam a power house will be built which will run its entire length and show an unbroken interior 1,000 feet long. The basement of this will be occupied by the water wheels, which are from the Stilwell Bierce, Smith-Vaile works at Dayton, Ohio. The main floor will contain the dynamos, of which there will be twelve, each of 1,000 horse power, or 12,000 horse power in all. They will be of the General Electric Co's latest multiphase type, and will generate current for transmission to Montreal for use there in lighting the city, operating the street railroads and in any and all other lighting and power purposes.

Apart from the fact that this plant will exceed in interest any yet installed, the contract for this electrical installation is the largest ever placed at one time for electric dynamos. It is also worthy of note that, although it was competed for by every prominent electrical manufacturer in the world, the superiority of the American apparatus kept the order with home manufacturers.

The diversity of uses to which electric motors are now being put is forcibly exemplified by a glance at the orders which the power and mining department of the General Electric Co. received during the first two weeks of last month. Motors were called for to operate printing presses, saws and planers in a box factory, an assortment of mining machinery in a coal mine, machinery in a large bakery, blowers in a stove works, a Gould fire pump, a mine pump, large Brush arc lighting dynamos, a jib crane, travelling cranes, machinery in an oil cloth works, inclined railway, etc., etc.

THE BERMUDA—A BRITISH-BUILT STEEL SAILING VESSEL.

Low rate, short limit tickets between Cleveland and Lorain have been placed on sale via the Nickel Plate road at $1.00 for the round trip. 77-7-31

One dollar round trip excursion tickets between Cleveland and Lorain are on sale by agents of the Nickel Plate road. 78 July 31

The Review Prints the News.

By watching carefully the various acts of both houses of congress connected with the final passage of the marine engineers' bill, the REVIEW managed to print, last week, the full text of the bill in less than twenty-four hours after its passage. As a result, we are in receipt of the following letter:

Office of the Secretary,
National Marine Engineers Beneficial Association,
CHICAGO, May 26, 1896.

MARINE REVIEW, Cleveland—Gentlemen: I am in receipt of yours of the 23rd, and in reply will say that the two articles published in the REVIEW is all that the most enthusiastic member could ask for. The full text of the bill, or law, as it now stands, has thus far only been published in the REVIEW; therefore, I will ask you to mail a copy to each corresponding secretary, whose address you will find enclosed, and send bill for same to me and I will remit the amount. I consider that every marine man who holds a United States license should read the REVIEW and become familiar with laws relating to the steam vessel inspection service, a subject that your journal has made plainer than any of its competitors. Wishing you success and continued prosperity,

I am very truly yours,
THOS. F. DOWD,
National Secretary.

Two Big Steam Yachts.

A twin-screw steel yacht, which is probably the largest vessel of her kind ever built in this country, was launched, a few days ago, by the John N. Handren Co., Erie Basin, South Brooklyn, N. Y. The yacht has been named Sovereign and is being built for M. C. D. Borden of New York. She is 212 feet on the water line, 250 feet 6 inches over all, 28 feet beam, 18 feet 6 inches deep and 12 feet draught. Her steel plates are lapped below the water line, but worked fair above. She has steel decks, covered with selected pine. Engines are of the triple expansion type, with cylinders 15, 24 and 39 inches diameter and 20 inches stroke, and were built by the W. & A. Fletcher Co. She will have two Babcock & Wilcox water tube boilers.

Of several yachts now building on the Clyde and in England for wealthy Americans, the most noteworthy is one that is nearing completion at the yard of Messrs. J. & G. Thompson for Mr. Ogden Goelet. This yacht is designed to be the fastest and most luxuriously appointed pleasure vessel that has ever taken form in Britain. She measures 310 feet over all, 40 feet beam and 36 feet deep, and will be propelled by twin screws, driven by triple expansion engines, supplied with steam from water tube boilers of the Almy type. Her coal carrying capacity will approach 1,000 tons, and under forced draught she will steam 18 knots at sea, although her measured mile performance is expected to approach 20 knots.

Strange Accident with Feed Pumps.

The following is from a chapter of accidents printed in the Engineers' Gazette of London:

"During a passage across the Atlantic the feed pumps suddenly refused their duty, and in spite of every effort, the feed water persisted in coming out of the overflow pipe instead of passing through the check-valves. The pumps were examined and found all right. The check-valves were well tapped with a spanner and nothing was apparently wrong. As the temperature of the feed water was much higher than usual, it was considered that the slide valves must be out of order. The state of the weather, however, was such that it was out of the question to think of lifting the covers, and there was neither compound gauge nor indicator to show what was going on internally. Here was a dilemma. The loss of fresh water could not be allowed to continue, and the engines could not be stopped long enough to find out the fault. A large cask was, therefore, lashed in a corner and the overflow pipe turned so as to discharge into it. With the aid of gaspipe, odd pieces of lead piping, and whatever else would serve the purpose, a suction pipe was constructed and connected in a rough and ready fashion to the donkey pump, and by this means the boilers were fed. This continued for two days. Then the weather moderated and arrangements were being made to lift up the valve chest covers, when all at once the overflowing ceased, the feed pumps commenced to work beautifully, and the passage was finished without a hitch. It was with considerable interest that the engines were examined as soon as possible. It was found that the high-pressure slide valve was worn ⅛ inch into the port face, and being slack sideways, a vertical ridge of ⅛ inch was left on either hand. During the heavy weather the valve had got on to the ridge on one side, and the constant list of the vessel caused by the gale had kept it there. There was consequently a clear passage leading to the low pressure casing. High pressure steam passing through the low pressure cylinder caused the feed water to become too hot, and the vapor in the pumps prevented them from working. When the vessel righted the valve dropped back into its place and everything went on as before. It may appear strange to those who have always been in well-equipped steamers, that a large set of compound engines should be fitted minus such necessities as compound gauges, but such was the spirit of economy in some companies that it was by no means an unfrequent occurrence. The holes for the indicator pipes had not even been bored."

Trade Notes.

Nearly 600 buoys in ship channels and over 70,000 passenger cars, as well as 32,000 locomotives, are now lighted by Pintsch gas in various parts of the world.

The Marine Manufacturing & Supply Co., No. 158 South street, New York, recently bought out the ship chandlery business of Haines & Hallock, Jersey City. Mr. Haines will be connected with the New York firm. This firm now carries the largest stock of brass work, ship chandlery and engineers' supplies of any concern in New York, and make a specialty of their Monitor side and deck lights, as well as complete outfits for yachts and merchant vessels.—Marine Journal.

Referring to the introduction of vapor steam lights on lake freight steamers, a representive of the General Electric Co. writes us that these lights have been used by his company for several years, and are on such lake vessels as the Kearsarge, Victory, Unique, McWilliams, Penobscot and others that were in commission last season. The list of electric plants installed this year on lage vessels by the General Electric Co. will represent in the aggregate the greatest amount of business ever done by an electrical concern in this line.

The Brown Hoisting and Conveying Company of Cleveland is to build for the Pennsylvania Company, on Pier J., Jersey City, a double cantilever machine for handling general merchandise. The machine has been designed for the work, and as it will be the first special machine for rapid handling of freight ever erected in New York, it is expected that more will follow, and that devices of this kind will change entirely the methods now in vogue. The machine will hoist its full load of five tons 150 feet per minute, and trolley same 900 feet per minute, while the entire rig will move along the pier 600 feet per minute. It is operated by steam and will be handled in every function by a single operator. The engines, boilers and operating mechanism are contained in a house 21 feet square on top of the machine. An attachment for handling bulk materials, such as sand, sulphur, pyrites, etc., and loading same into box cars will be provided.

Pleased with the Directory.

Officers of the Ship Masters' Association are being complimented upon the success of their 1896 directory. Following is a copy of a letter taken from Secratary Collier's correspondence on the subject:

Mr. W. A. Collier, Ship Masters' Association, Cleveland—Dear Sir:—We are in receipt of your copy of Ship Masters' Directory for 1896, and must say that we are very favorably impressed with the little work, which is neatly gotten up. We are pleased with our advertisement, the location is good, and the display conspicuous, and we believe will bring us good returns. Will you kindly send us an extra copy of directory? Agreeable to your request of 5th inst., we enclose check to cover bill of advertisement. Wishing the association every success,

We are, very respectfully,
Duluth, Minn., May 18, 1896. M. S. BURROWS & Co.,

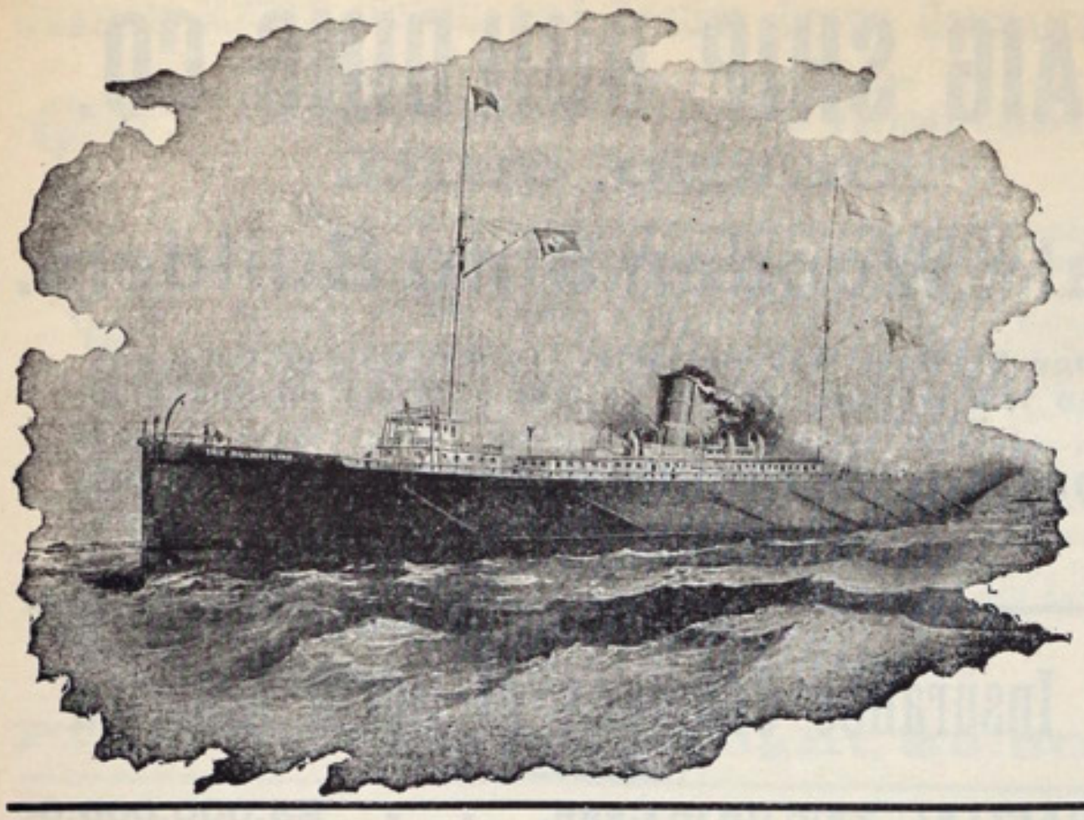
Members of the Ship Masters Association can obtain the directory at the following places: Geo. Wilson, foot of Woodward avenue, Detroit; office of Thompson's tug line, Port Huron; F. B. Higgie, No. 1 Franklin street, Chicago; Alex Sinclair, Board of Trade Building, Duluth; Maytham's and Hand & Johnson tug offices, Buffalo; J. McSweeney, Milwaukee; E. G. Ashley, Toledo; V. O. T. office, Main street bridge, Cleveland.

About June 1, a fog bell will be established at the light-station on the extremity of Harbor point, north side of Little Traverse bay, Lake Michigan, to be struck by machinery a double blow every thirty seconds during thick or foggy weather, and about June 4, the color of each of the lights in the Pilot island range, Sault river, will be changed from red to white.

The Western Union Telegraph Co. now has an office at Detour. Rates are the same as those to the Sault.

Round trip excursion tickets between Cleveland Lorain may be secured via. the Nickel Plate road at $1.00. 79 July 31

OFFICE OF THE LIGHT-HOUSE ENGINEER, 7th and 8th Light-house Districts, New Orleans, La., May 27, 1896, Proposals will be received at this office until 12 o'clock, noon, on the 16th day of June, 1896, for furnishing a new boiler for the light-house tender Arbutus. Specifications, forms of proposal, and other information may be obtained on application to this office. The right is reserved to reject any or all bids and to waive any defects. JAMES B. QUINN, Major, Corps of Engineers, U. S. A., Light-House Engineer.



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Keeping a sharp look-out for Shipman's Koal Dock.

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RIVER DOCK, West River Street. Telephone 1441.

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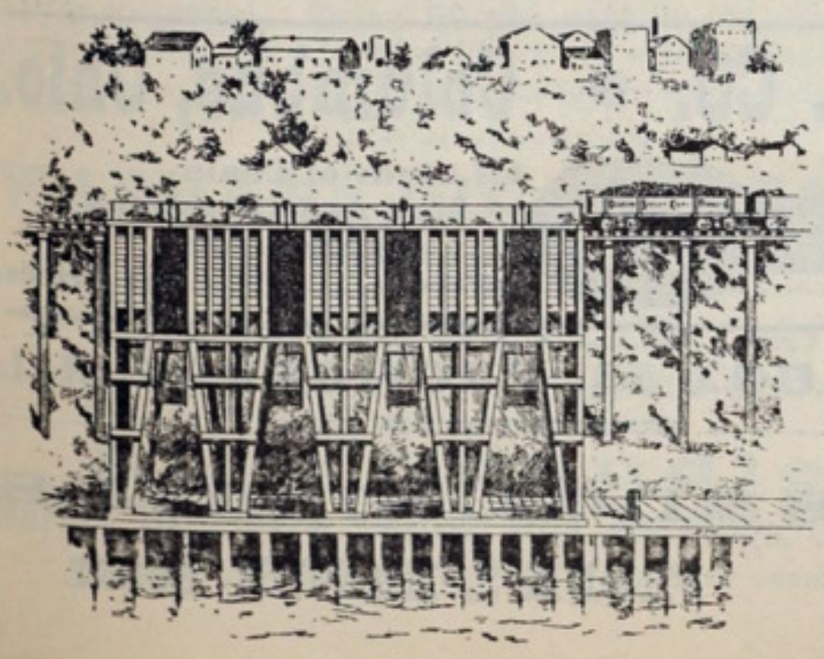
Cuyahoga River, just above Superior St. Viaduct, Cleveland, O.



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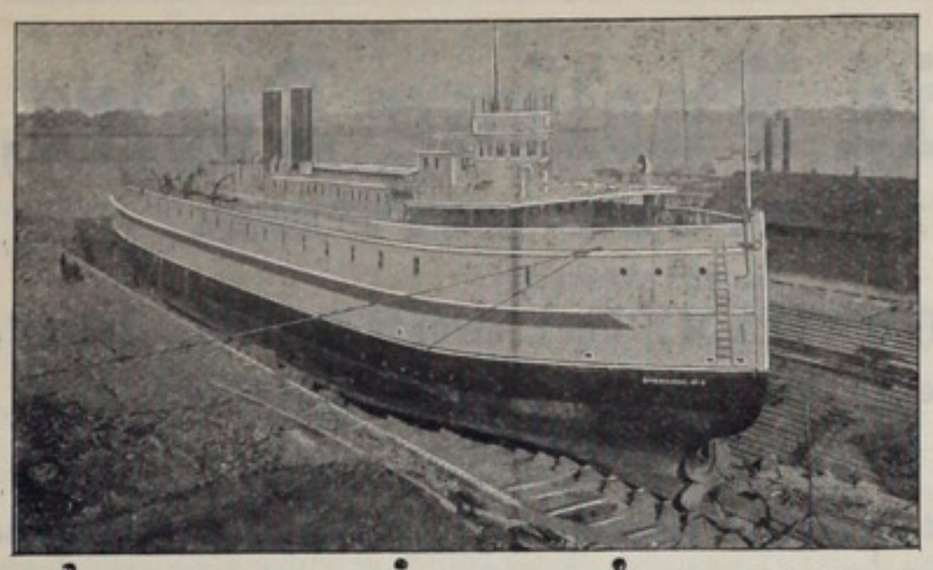

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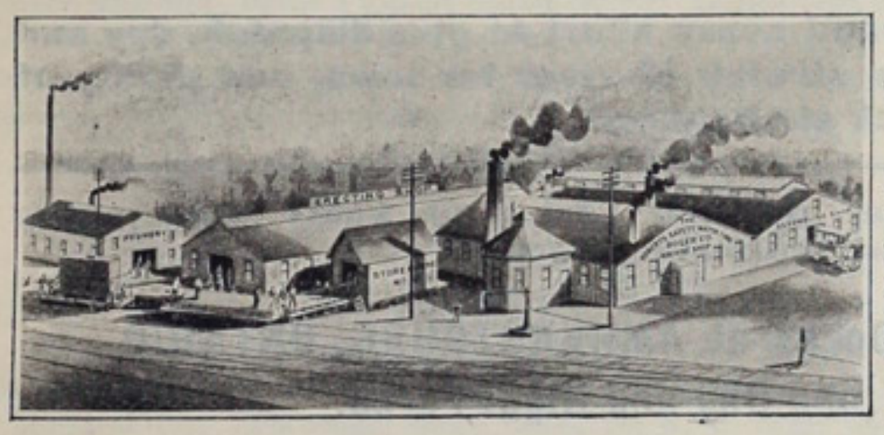

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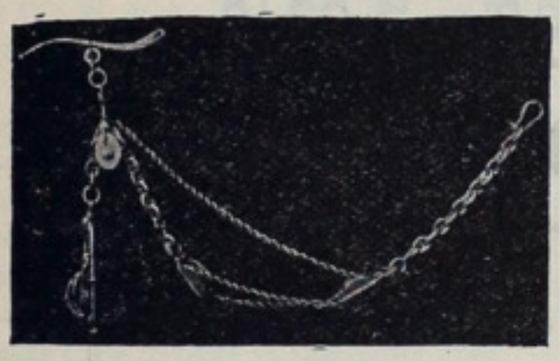

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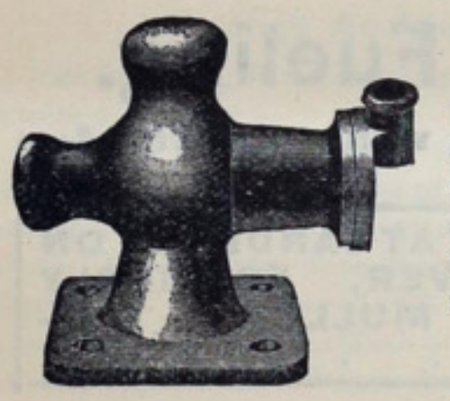

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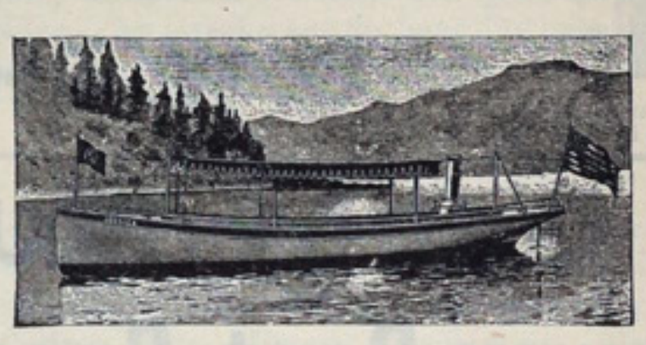

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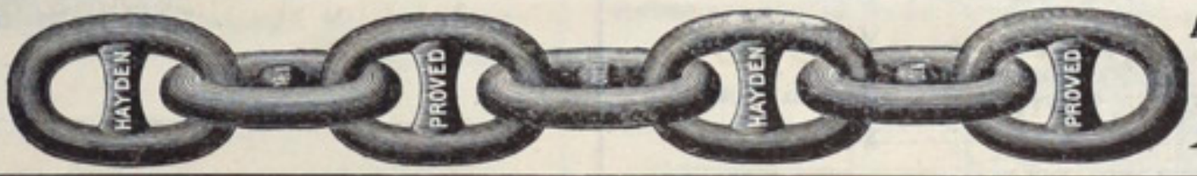

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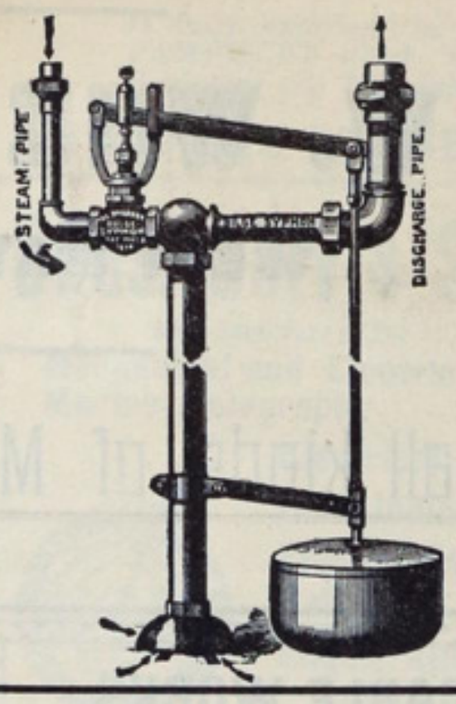

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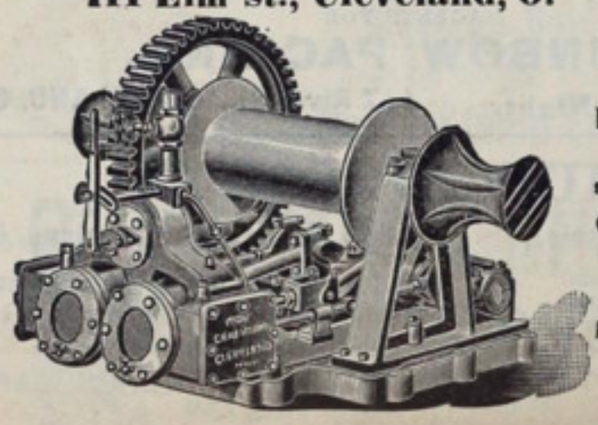

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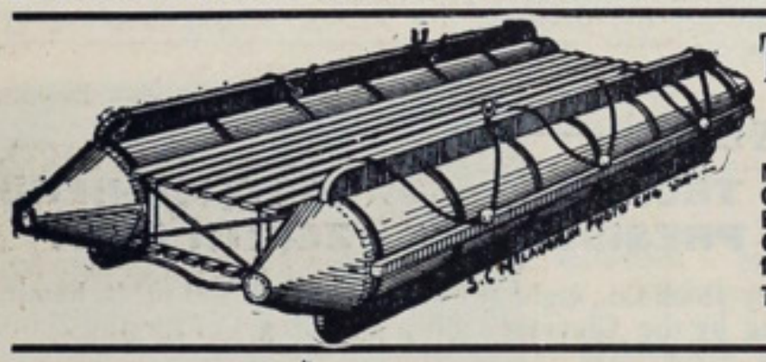

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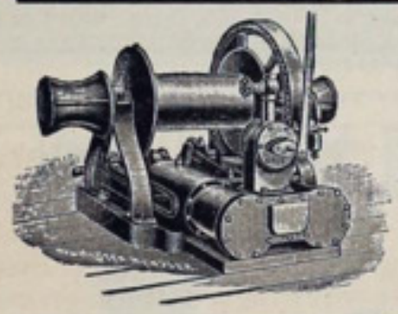

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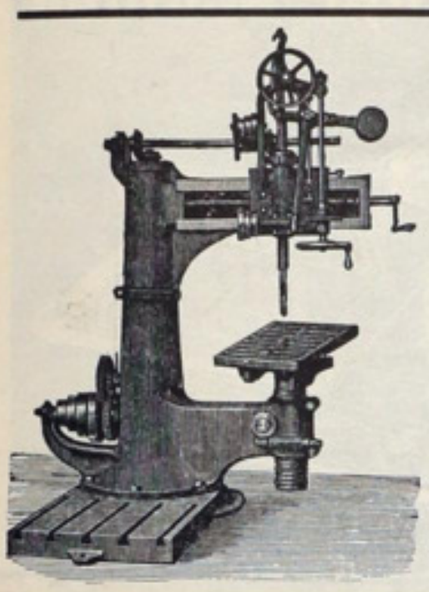

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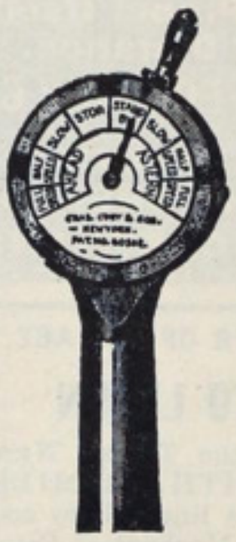

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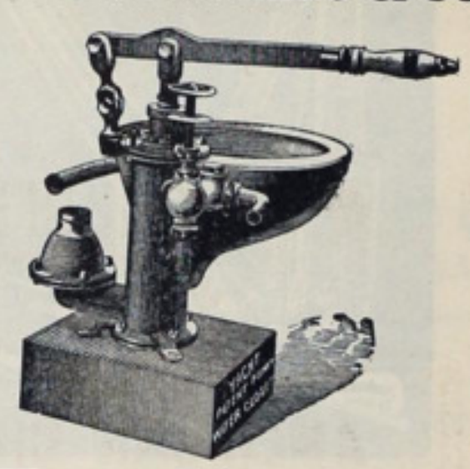

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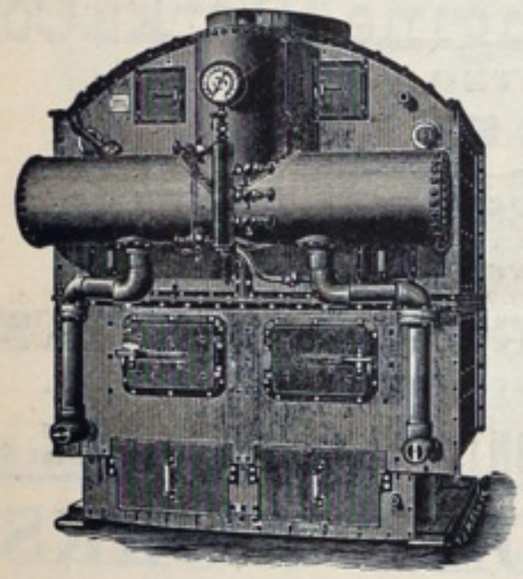

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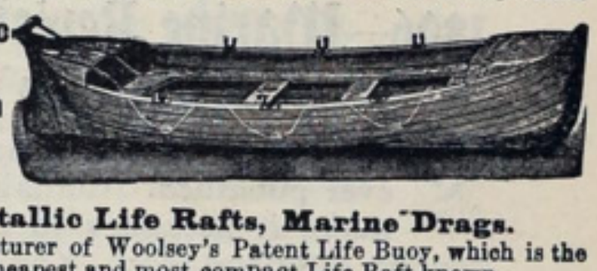

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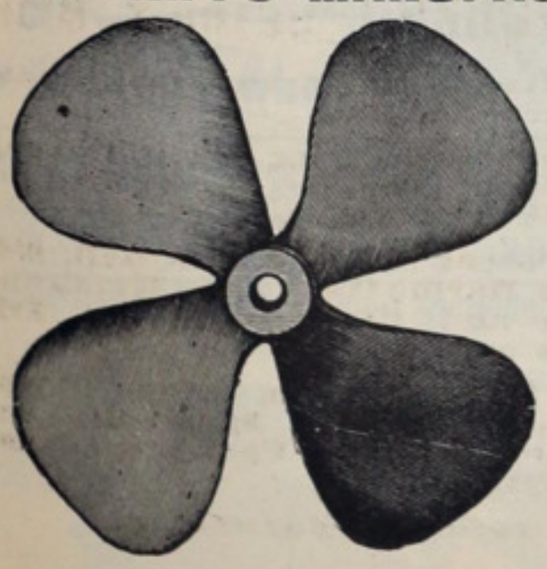

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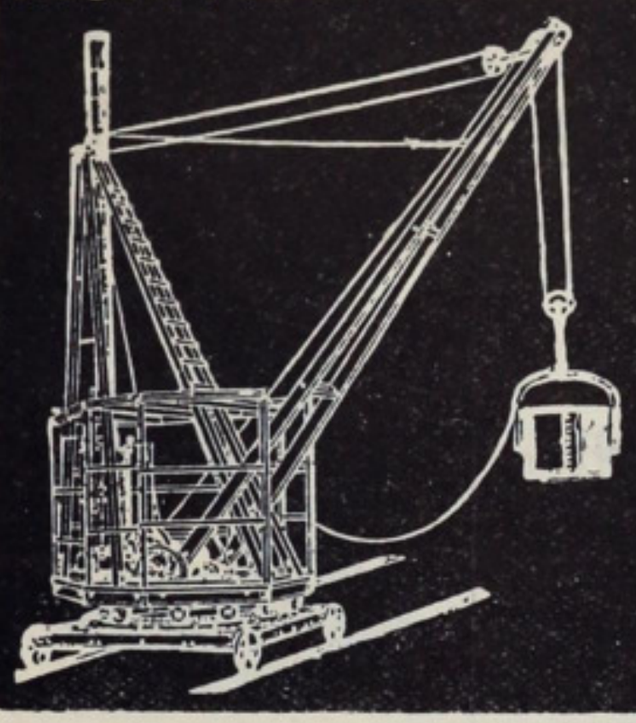

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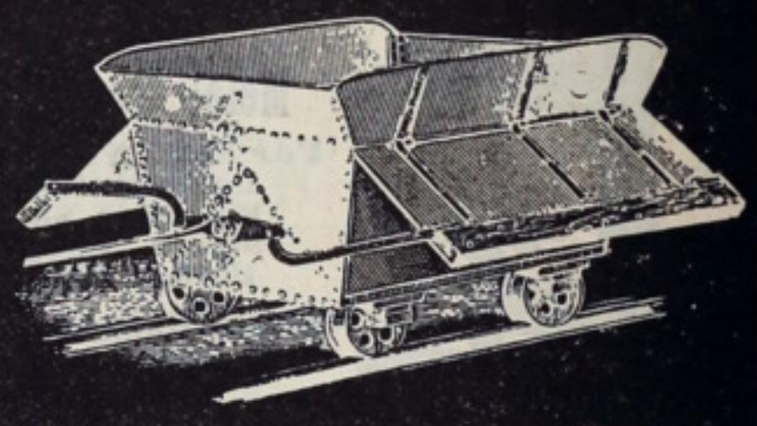

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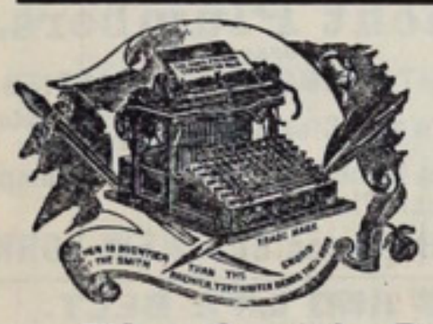

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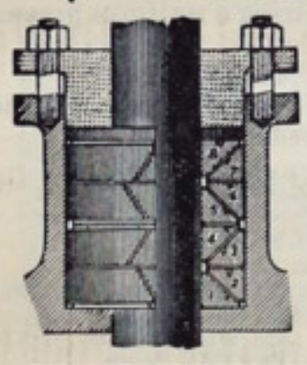

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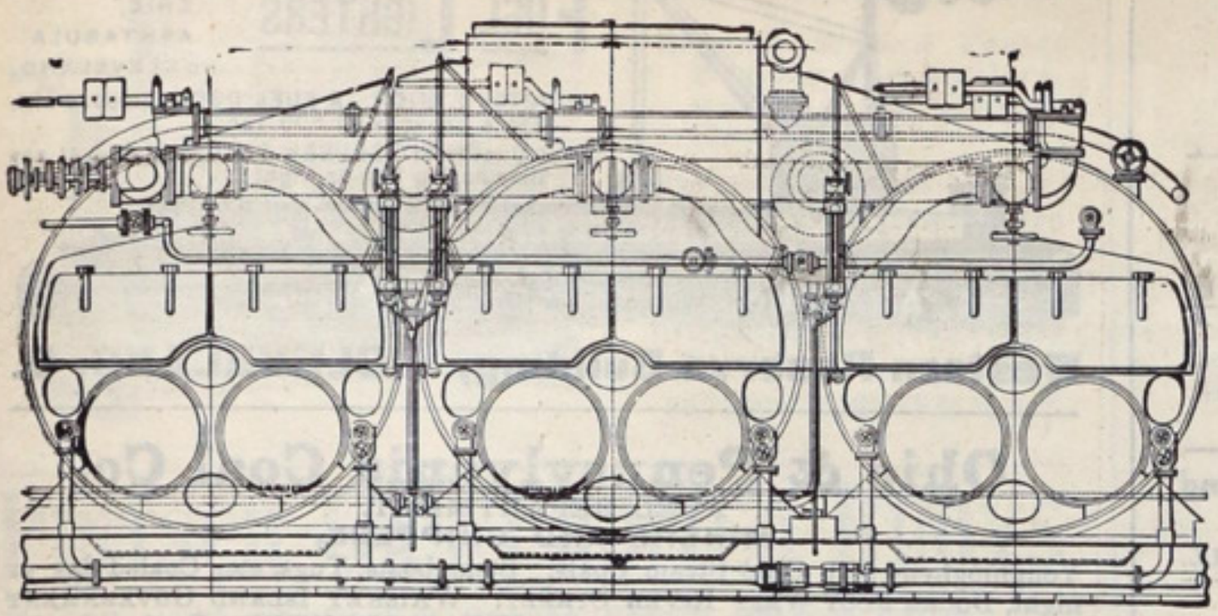

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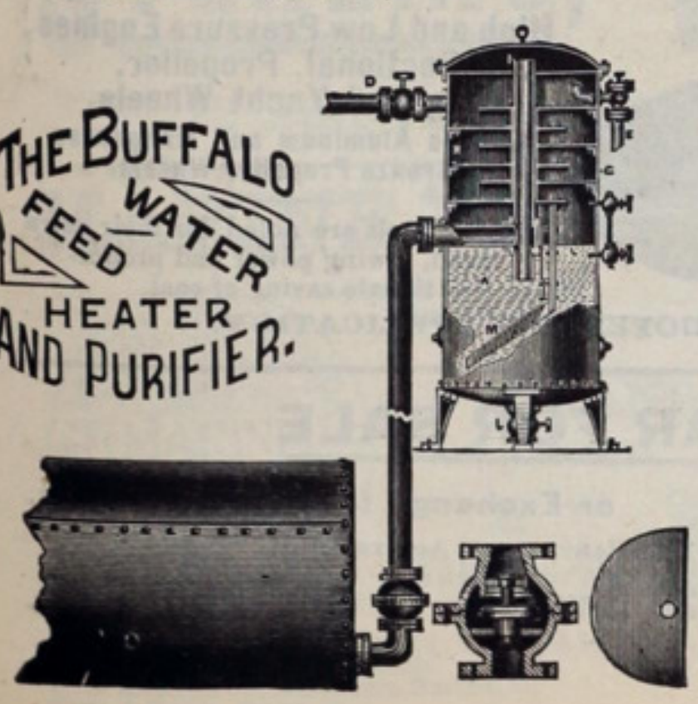

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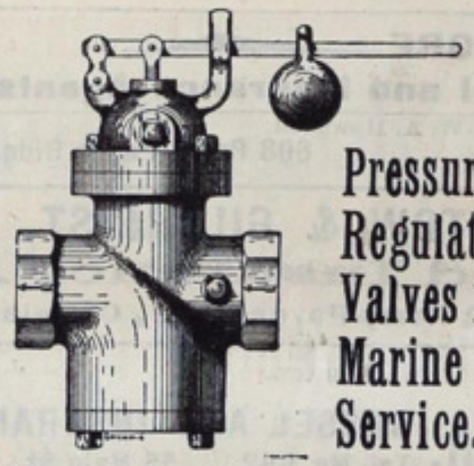

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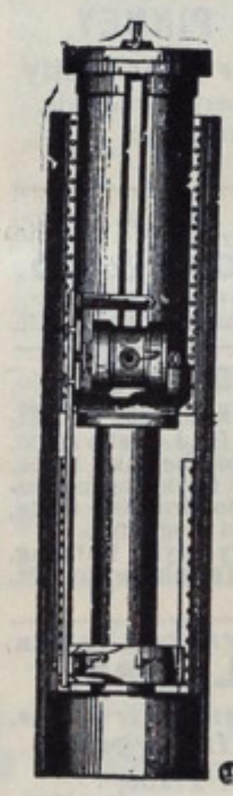

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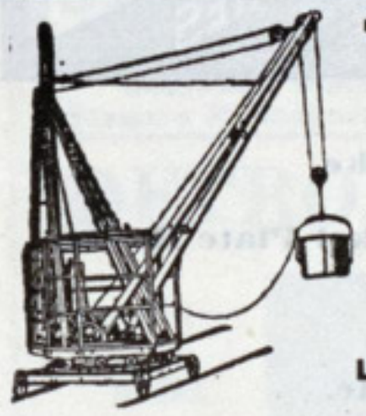

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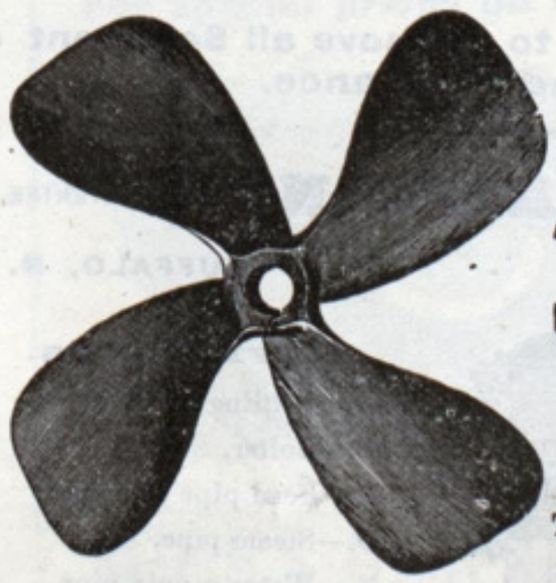

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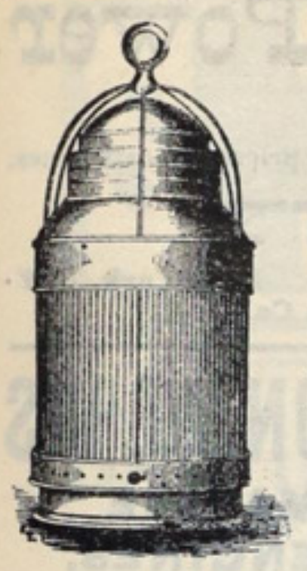

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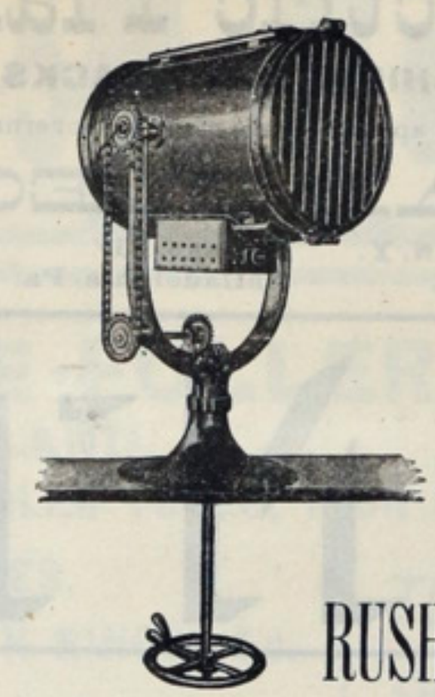

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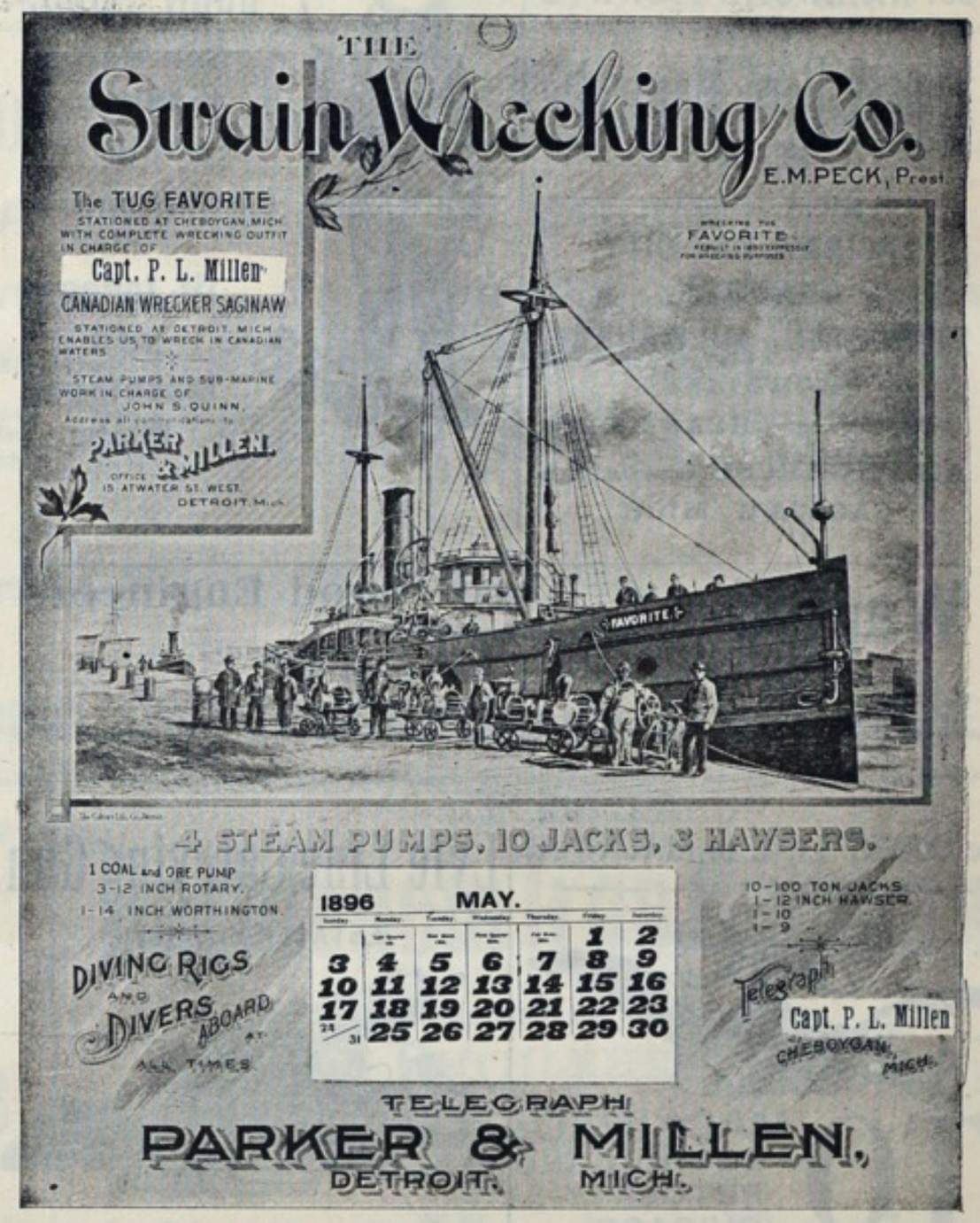

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By The Middletown & Portland Bridge Co., the following boats lately used by them for the ferry over the Connecticut river, connecting Middletown and Portland.

Steamer Brownstone:

91 ft. long, 40 ft. beam, draws 6 ft. of water; tonnage 253 gross and 127 net; burns about 1½ tons of coal per 15 hours; fitted with two condensing engines; speed about 9 miles per hour.

Steamer Gildersleeve:

60 ft. long, 15 ft. beam, draws 4 ft. of water; tonnage 23 gross, 22 net.

Have with same, 1 large scow and two landing bridges.

The whole are in good condition, having been lately used by us, but as we have no use for them, their place being taken by a bridge.

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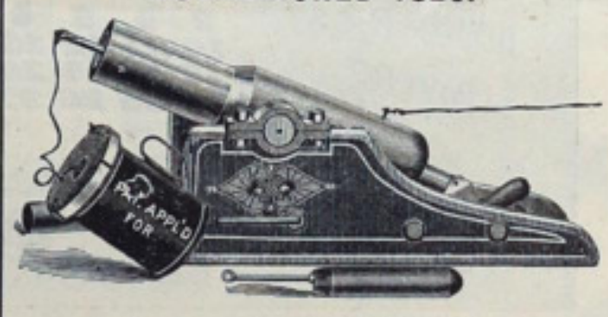

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Beam	44 "	40 "
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Both boats are built of iron, and are equipped with twin screws, with independent engines and boilers.

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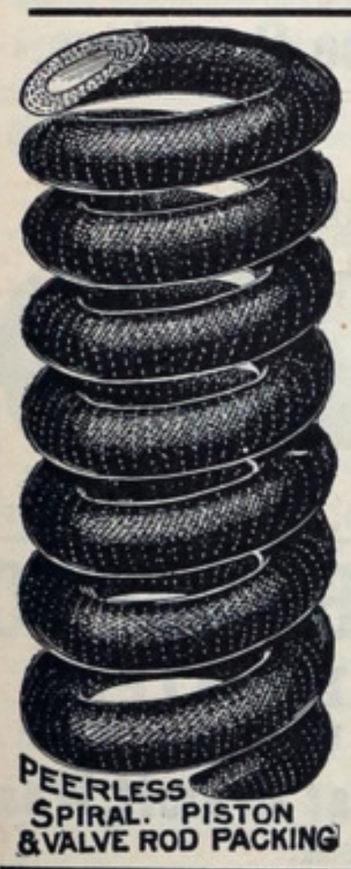

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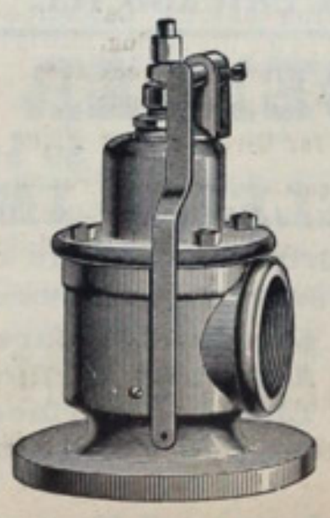

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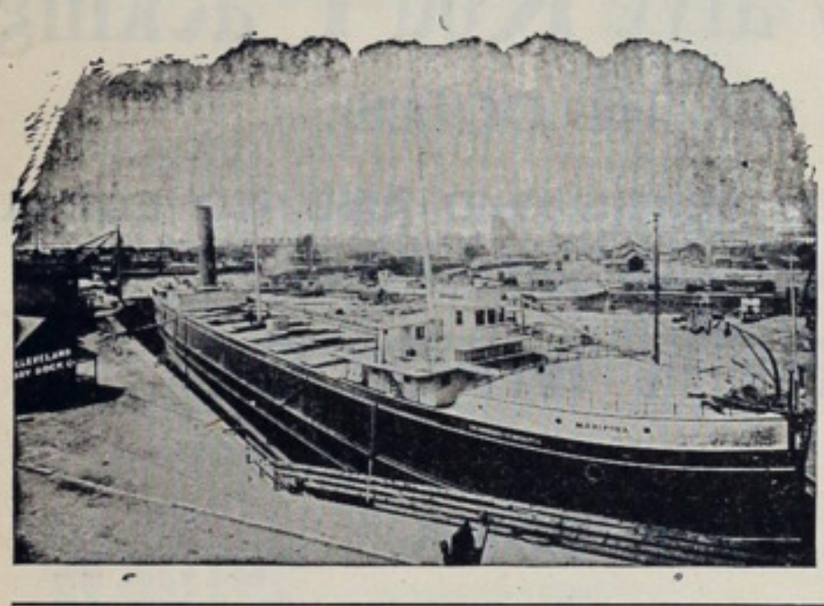

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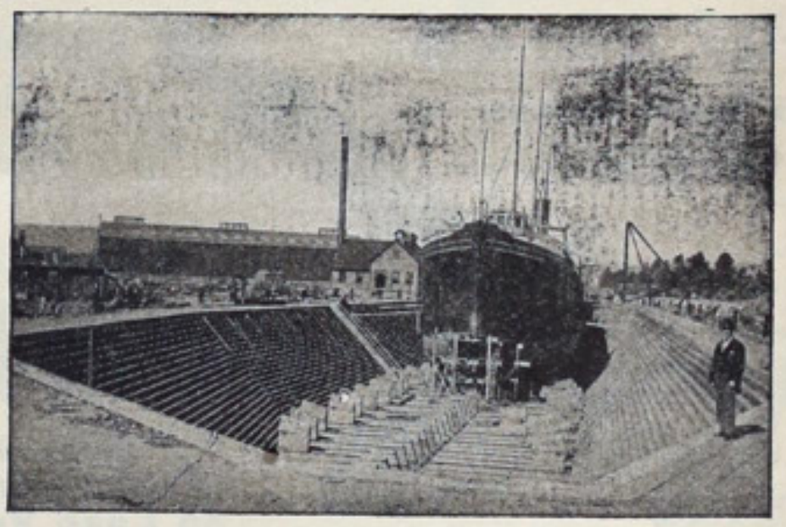

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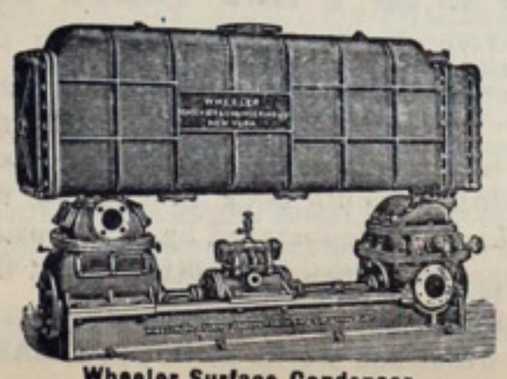

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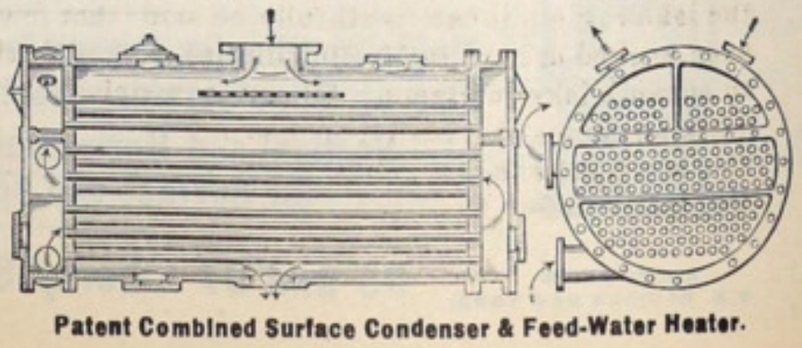

Patent Combined Surface Condenser & Feed-Water Heater.